

Severe Storm Assessment Using Satellite Data: Case Studies from Iowa in 2009

Kevin Gallo

NOAA/NESDIS Sioux Falls, SD

James Vogelmann

USGS/EROS Sioux Falls, SD

ABSTRACT

Satellite data were evaluated for their usefulness to validate severe storm information and products that included the NEXRAD LEVEL-III Hail Index and the National Climatic Data Center (NCDC) Storm Events data records. Several severe storms that impacted the State of Iowa during 2009 were examined. The storms selected for this study occurred from May through August 2009 when agricultural crops were at a variety of stages of development and impacted by the storm events. The satellite sensor data used in this study were acquired by the Moderate Resolution Imaging Spectroradiometer (MODIS) and Landsat-5 and -7 sensors. MODIS has similar characteristics to the Visible/Infrared Imager Radiometer Suite (VIIRS), the future NOAA operational sensor replacement for the AVHRR. MODIS image data that depict the presence and abundance of green vegetation were selected prior to and after the storm events. The data were digitally processed to identify spectral reflectance changes that were then compared to the LEVEL-III Hail Index and NCDC Storm Events data records. There were no apparent indications of storm damage detected in the satellite data associated with an early May (6 May 2009) storm. However, the impact of storm events of 17 June, 24 July, and 9 August 2009 on vegetation were clearly depicted within the satellite data. The general characteristics of the satellite data utilized in this study will be discussed, as will the availability of the data and future satellite data products that might be useful for severe storm assessment.